

## Section 8: Water Recycling

Due to limited supplies, the Vallecitos Water District's (VWD's) commitment to water conservation and sustainability has significantly increased over the last 5 years and is demonstrated by its successful water recycling efforts.



*Meadowlark Water Reclamation Facility*

Recycled water is wastewater that has undergone tertiary treatment so that it can be used for irrigation or other non-potable uses. To produce recycled water, secondary treated effluent undergoes filtration and chlorination. Up to 5 million gallons per day (MGD) of wastewater is treated at VWD's Meadowlark Water Reclamation Facility (MRF), with an average of around 3.5 MGD being recycled for use in landscaping at parks, schools, golf courses, flower fields and municipalities. Wastewater that is not recycled at MRF is sent to the Encina Water Pollution Control Facility (EWPCF), a regional facility owned jointly by six public agencies, where it is treated and reclaimed or discharged to the ocean.

By purifying wastewater and recycling water for reuse at MRF, VWD has been effective at reducing the overall regional demand for imported water, which is essential as the San Diego region has few local sources of water and therefore must import most of its water from hundreds of miles away. Imported water sources are potentially subject to drought and emergency outages during catastrophes such as major earthquakes.

To meet current and future water needs, the San Diego region must diversify its sources of water and increase its use of locally produced water. Recycled water is an important piece of the puzzle in solving the region's long-term water reliability needs. By taking a proactive role in producing recycled water, VWD has continued to increase and offset San Diego's need to import water, continually improving our quality of life.

This section describes VWD's wastewater system, as well as how the wastewater is generated, collected and treated. Further, this section details how the wastewater is disposed of or recycled, and how VWD encourages water recycling.

## 8.1 Wastewater System Description, Generation & Treatment

VWD's existing system includes a wastewater collection system, wastewater treatment facility and water reclamation facility. VWD has approximately 19,678 sewer connections. The existing wastewater collection system is composed of treatment facilities, major conveyance facilities, gravity mains, trunk sewers, lift stations, siphons and force mains. An average of 6.8 MGD of wastewater is collected by VWD's conveyance system, which consists of more than 178 miles of pipeline ranging in size from 4-inch pipe to the 54-inch section of the land outfall. VWD operates four lift stations with pumping capacities ranging from 100 gallons per minute (gpm) to over 2,000 gpm. This collection system conveys the wastewater for treatment to either MRF or EWPCF.



*Questhaven sewer lift station*

VWD's 23-square mile sewer service area is divided between two principal drainage basins which are named based on the treatment facility which serves it. The treatment facilities used by VWD are the regionally owned EWPCF located on the coast in Carlsbad, and MRF located in the southwestern portion of VWD's service area. A third drainage basin is located in the northern part of VWD that naturally drains away from the existing collection system and is referred to as the Northern Tributary Area (NTA). The NTA is entirely made up of rural residential and agricultural land uses, and is served by on-site septic systems or by a neighboring agency. Land uses within the NTA are not planned to change in character and as such it is assumed that on-site septic systems will continue to service this area.

### 8.1.1 Meadowlark Water Reclamation Facility

MRF is located in the City of Carlsbad in the southwestern portion of VWD's service area and treats wastewater to meet recycled water standards in accordance with State of California Title 22 requirements and under the provisions of Waste Discharge Permit R9-2007-0018 issued by the State of California Regional Water Quality Control Board

for Region 9. It was originally built in 1958 as a 0.25 MGD secondary treatment plant, and expanded to a 2 MGD, tertiary treatment facility in 1982. Capacity was re-rated in 1996 to 2.25 MGD.

The plant underwent construction in 2005 to increase capacity to 5 MGD. This was completed in 2008 and added preliminary treatment (grinders/augers) to remove large debris and primary treatment (settling basins) to allow greater removal of solids. The existing fixed-film biological process, which utilized Rotating Biological Contactors, was removed and replaced with roughing filters, which is a more efficient fixed-film biological process. Activated sludge, another biological process, was also added, which entailed adding aeration basins along with Return Activated Sludge and Waste Activated Sludge.



*Meadowlark Water Reclamation Facility*

Currently, recycled water (up to 5 MGD) from MRF that is sold under contract to the City of Carlsbad (Carlsbad) and the Olivenhain Municipal Water District (OMWD) is transported through VWD's 24-inch recycled water pipeline that provides additional points of service to both Carlsbad and OMWD. Carlsbad is contracted to purchase a minimum of 2 MGD December through March and 3 MGD the remainder of the year. OMWD is contracted to purchase up to 1.5 million gallons year-round, provided adequate effluent is available.

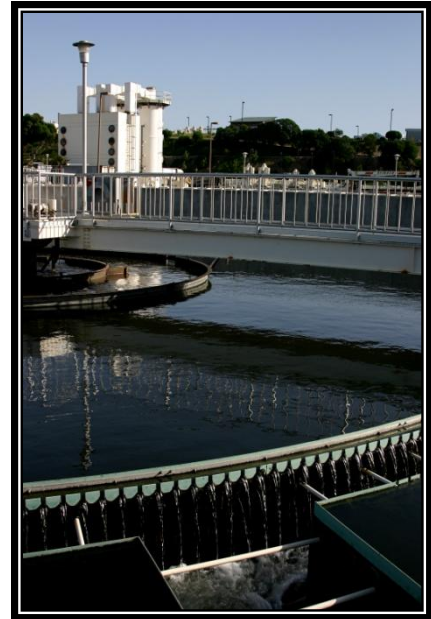


*54-million-gallon Mahr Reservoir*

Surplus water is stored in VWD's 54-million-gallon Mahr Reservoir, which is located just south of MRF. If necessary, water from both MRF and the Mahr Reservoir can be sent through VWD's "Failsafe" pipeline to the EWPCF for disposal into the ocean. Currently, the MRF basin produces 0.65 MGD for recycling and the remaining wastewater is pumped from the Encina basin. MRF does not have the capacity to treat solids. All solid material is sent to the EWPCF via VWD's land outfall.

### **8.1.2      *Encina Water Pollution Control Facility***

The EWPCF, which was built in the mid-1960s, is located on the coast in Carlsbad and is a regional facility owned jointly by six public agencies: VWD, the cities of Carlsbad, Vista and Encinitas, the Buena Sanitation District and the Leucadia Wastewater District. VWD owns about 24 percent of the facility and has the ability to send up to 10.5 million gallons a day of solids and 7.54 million gallons per day of liquids to the EWPCF. Average current flows to the EWPCF are approximately 3.54 MGD.



*Encina Water Pollution Control Facility*

The facility provides wastewater treatment services to approximately 300,000 North San Diego County residents. The EWPCF is a 43.3 MGD activated sludge treatment facility (average influent flow is around 23.3 MGD). The facility is primarily a secondary treatment and disposal facility. Treated wastewater from the EWPCF is sent through an ocean outfall extended along the ocean floor and transported about 1½ miles into the ocean on the coast in Carlsbad at about a depth of 150 feet. A small portion of the EWPCF's treated wastewater is diverted to various reclamation facilities, which are detailed further in this section.

### **8.1.3      *Participation in a Regional Recycled Water Plan***

In addition to being actively involved in producing recycled water, VWD is also currently a member of the North San Diego County Regional Recycled Water Project. This group of eleven North County water and wastewater agencies has joined together to investigate opportunities for expanded use of recycled water within North San Diego County and document their efforts in a Facility Plan Report, which will be used to pursue local, State and Federal funding. This planning study:

- Compares recycled water supplies with projected demands
- Investigates seasonal and daily storage opportunities
- Considers regulatory requirements and basin objectives
- Develops regional concepts to expand the use of recycled water
- Identifies regional facilities and concept-level costs
- Prepares a Recycled Water Facility Plan



The final Facility Plan Report is scheduled to be produced by August of 2011.

### **8.1.4      *WateReuse Association Membership***

The San Diego Regional Chapter of the WateReuse Association was founded in 2000 to support the ever-increasing focus on water recycling to supplement and diversify the San Diego region's water supplies. Members of the San Diego Regional Chapter include recycled water purveyors, recycled water customers, regulatory agencies, engineering and consulting firms, equipment vendors, as well as interested individuals from the community at large. The mission of the San Diego Regional Chapter of the WateReuse Association is to provide a forum for the exchange of information to promote the beneficial use of recycled water in the San Diego region. VWD is an active member of the California WateReuse Association.

## **8.2            Wastewater    Disposal    and    Recycled Water Uses**

### **8.2.1      *Recycled Water Currently Being Used***

VWD currently has the ability to recycle up to 74 percent of its wastewater by utilizing its Lift Station No. 1 on San Marcos Boulevard to redirect wastewater that would normally be sent to the EWPCF to the MRF instead. All of the recycled water produced at MRF is sold under contract to the City of Carlsbad and OMWD. Carlsbad purchases up to 3 MGD and OMWD purchases up to 1.5 MGD. With the exception of the on-site irrigation at MRF, VWD currently does not sell its recycled water to customers within its service area. At this time, it is not cost-effective to install the recycled water infrastructure and to pump the recycled water to areas that could use it within VWD's service area.

VWD is also a member of the regional EWPCF and sends an average of 3.54 MGD of wastewater to this facility for treatment. The EWPCF has the ability to treat up to 43.3 MGD, but currently treats an average of 23.3 MGD of wastewater from its 6 member agencies, a small portion of which is recycled as described below:

- The EWPCF produces about 1 MGD of recycled water onsite. This water is used in the plant and reduces the costs for potable water. Recycled water uses

include: equipment wash down, cogeneration engine cooling; odor reduction and landscape irrigation.

Two reclamation plants also currently treat secondary effluent from the EWPCF:

- The Leucadia Wastewater District pipes treated secondary effluent from the EWPCF to their Gafner Water Reclamation Facility. This facility presently produces 86 million gallons of recycled water per year (0.25 MGD), but has the capacity to produce up to 350 million gallons per year (approx. 1 MGD). Presently, this water is sold to the City of Carlsbad, who acts as the retailer and sells it to the La Costa Resort & Spa Golf Course for irrigation purposes.
- The second reclamation facility is the Carlsbad Water Recycling Facility, which is located adjacent to the EWPCF but is owned by the Carlsbad Municipal Water District. Up to 4 MGD of secondary effluent from the EWPCF is diverted from the ocean outfall and delivered to this facility. On average, 2 MGD is treated at this facility. The treated water is then supplied to the City of Carlsbad. The City of Carlsbad has about 78 miles of recycled distribution pipeline, which supplies 357 recycled-use sites.



*Treated water storage tank at  
Carlsbad Water Recycling Facility*

## **8.2.2      *Potential Uses of Recycled Water***

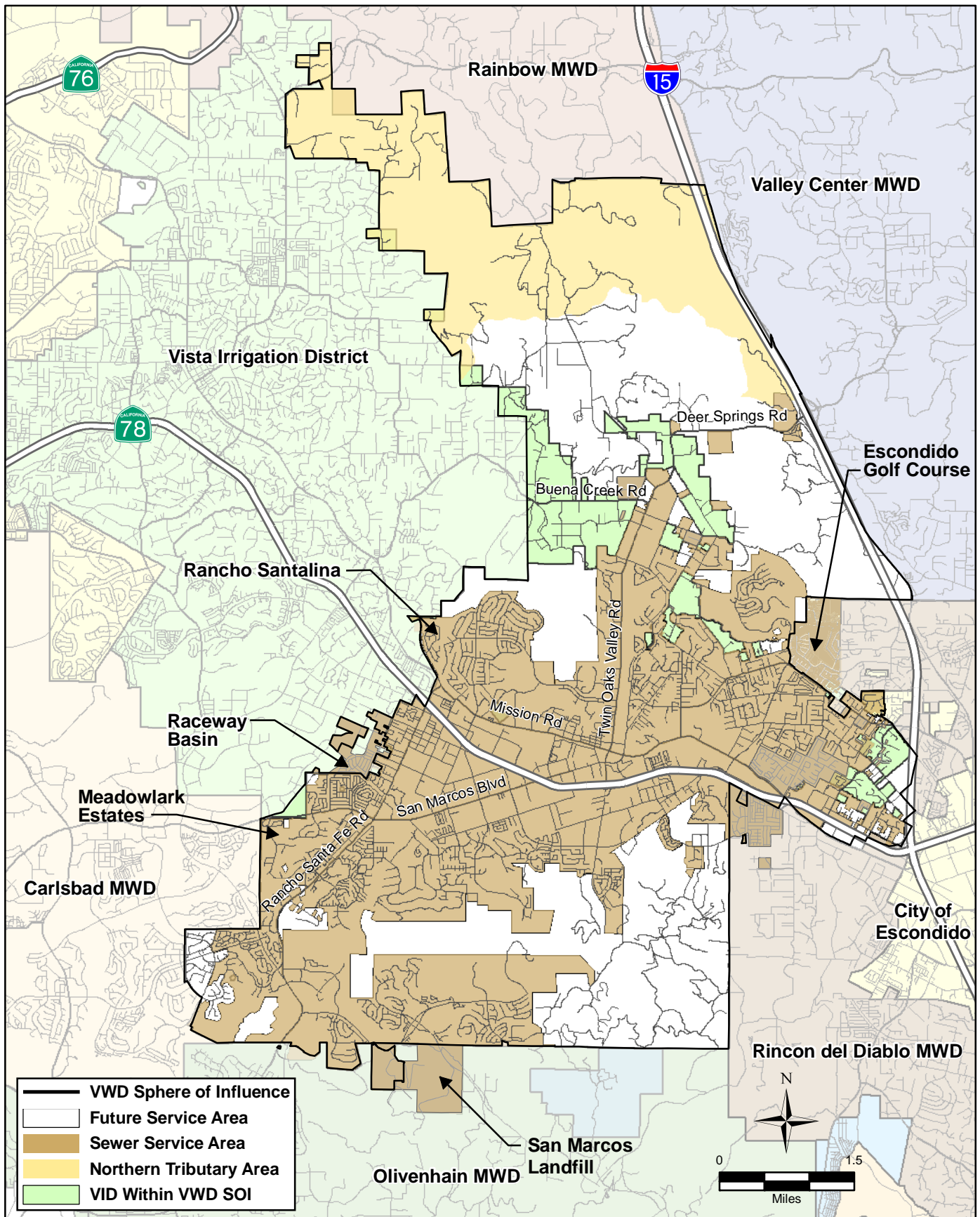
Table 8-1 below shows the past, current and projected average wastewater collection and treatment volumes for VWD's service area. These include areas within VWD's service area that may or may not be expanded to, such as the Northern Tributary Area. Table 8-1 also shows breaks-down VWD's average wastewater volume between that which meets recycled water standards and that which is typically treated to secondary level and disposed of through the EWPCF ocean outfall.

*Table 8-1: VWD Wastewater Collection and Treatment Volumes*

	2005 <sup>1</sup>	2010 <sup>1</sup>	2015 <sup>1</sup>	2020 <sup>1</sup>	2025 <sup>1</sup>	2030 <sup>1</sup>
<b>Wastewater Volumes Collected &amp; Treated in VWD's Service Area</b>	7.3	6.8	9.4	10.6	11.6	12.9
<b>Volume that Meets Recycled Water Standards<sup>2</sup></b>	2.0	5.0	6.4	6.4	6.4	6.4
<b>Non-Recycled Wastewater that is Disposed of through the EWPCF Ocean Outfall</b>	5.3	1.8	3.0	4.2	5.2	6.5
<sup>1</sup> In units of millions of gallons per day						
<sup>2</sup> Projected recycled water volumes for 2015 through 2030 includes 5.0 MGD at MRF and an estimated 1.4 MGD-equivalent from EWPCF (VWD owns 24 percent of EWPCF wastewater capacity, and 6 MGD of recycled water is produced from EWPCF wastewater)						

Since the entirety of VWD's recycled water is sold under contract to the City of Carlsbad and the OMWD, it is these agencies' responsibility to encourage and develop uses of recycled water. VWD has purchased and/or produced brochures, videos and other educational materials to inform people on the uses and benefits of recycled water. Information is also posted on VWD's website. Meanwhile, Carlsbad and OMWD encourage and optimize recycled water use via a combination of financial incentives (such as a reduced purchasing rate), policies, ordinances, and staff assistance.

There are currently no future plans to supply recycled water within VWD's service area. However, VWD recognizes that there will be a greater need for alternative water sources in the future. As a result, VWD is actively looking at implementing a regional water recycling plan, known as the North San Diego County Regional Recycled Water Project. This regional water recycling plan could tie VWD's system together with other water and wastewater agencies to increase future recycled water use. The recycled water could be supplied to provide irrigation water to institutional users, parks and golf courses, landscape medians, and large homeowners associations that currently are supplied with potable water. By 2020, VWD may add up to 1,400 acre-feet, or 2.2 MGD, of potential recycled water demand by customers that are currently supplied with potable water. By 2030, this demand could increase to 2,400 AF (3.9 MGD).



SOURCE: LAFCO SOI - Affirmed 08-06-2007  
VSD GIS Data - 07-17-2008, provided by District

WASTEWATER SERVICE AREA  
FIGURE 8-1

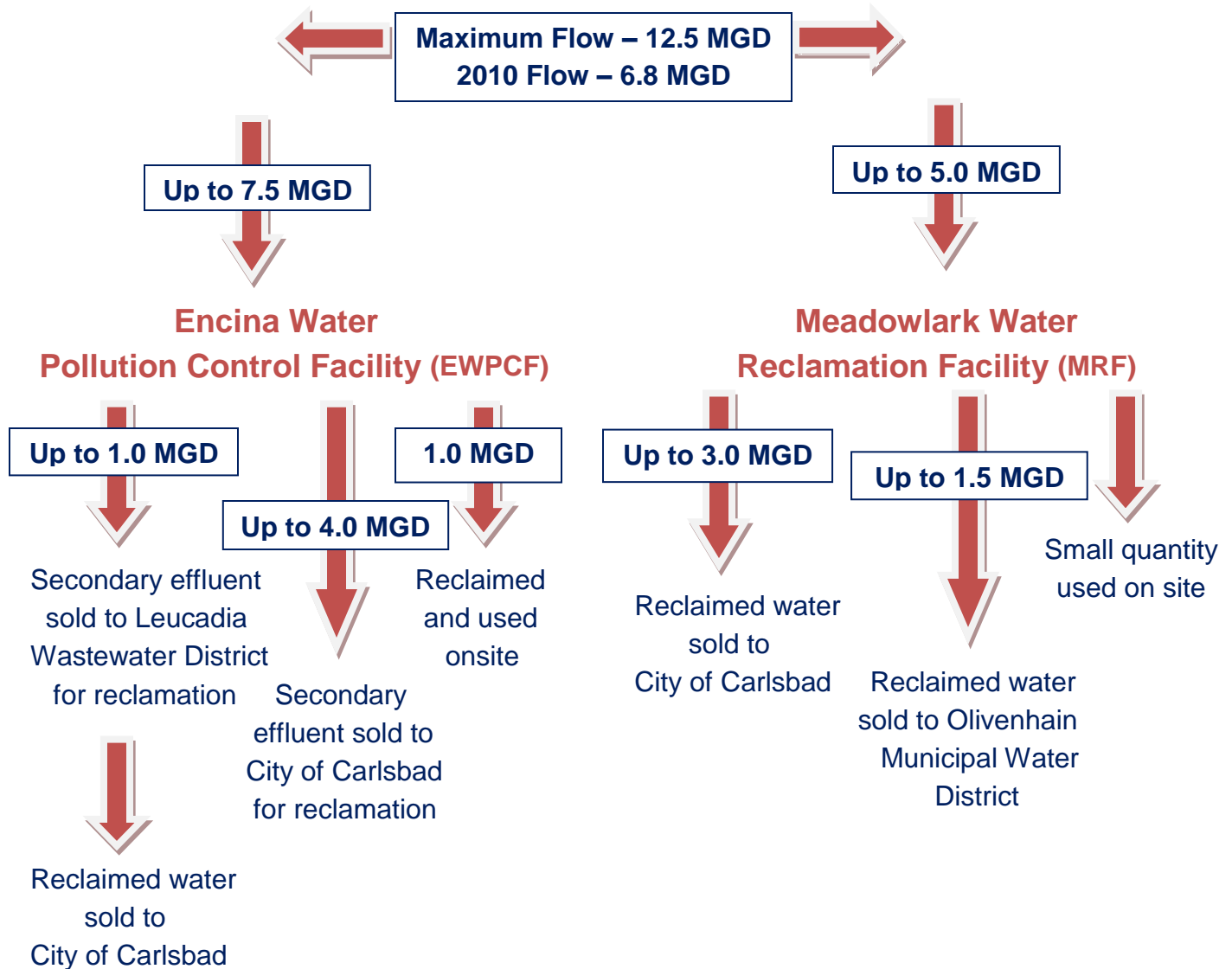
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*Figure 8-2: VWD Daily Wastewater and Reclamation Flows*

**(Maximum wastewater flow that can be generated in service area is 12.5 MGD)**

**Wastewater flow and reclamation is described below:**



- Note: Based on VWD's 2010 average daily wastewater flow of 6.8 MGD and MRF's recycling capacity of 5 MGD, up to 74% of the wastewater generated in VWD's service area can currently be recycled. ( $5 \text{ MGD} \div 6.8 \text{ MGD} = 74\%$ ) By factoring in the wastewater that can be recycled at the EWPCF, this percentage can further increase.